

# MEMS Reflective Fiber Optical Variable Attenuator With Power Monitor

Protected by US Patent 20170184840A1 and World Wide Patent PCT/US2015/022117

## Product Description

This device offers all the desirable features in a VOA, including low cost, compact size, high reliability, direct low voltage driver, and integrated power monitor. The tap can monitor either input or output power. Temperature compensated version is also available. The MEMS Series Fiber Optical Variable Attenuator uses a patented thermal activated micro-mirror, moving-in and -out optical paths, uniquely offering large extinction ratio, and very long life cycle. The thermal MEMS is insensitive to moisture and ESD without drift issues, providing a high reliability platform for over 25 years continuous operation. The VOAs are bidirectional and are Telcordia standards GR1221 qualified.

Agiltron provides customized design and modular assemblies to meet control and integration applications.



## Performance Specifications

<i><b>MEMS VOA with Tap</b></i>	Min	Typical	Max	Unit
Operation Wavelength	1260		1620	nm
Insertion Loss <sup>[1]</sup>		0.6	1.2	dB
Polarization Dependent Loss <sup>[2]</sup> (SM version only)		0.15	0.5	dB
Wavelength Dependence Loss <sup>[3], [4]</sup>		0.2	0.6	dB
Attenuation Range	30	40	50	dB
Attenuation Resolution	Continuous			
Extinction Ratio (PM version only)	18	23	25	dB
Polarization Mode Dispersion (SM version only)		0.01	0.05	ps
Return Loss	45			dB
Response Time		3	6	ms
Driving Voltage <sup>[5]</sup>		4.5	5	V
Device Resistance	80	100	120	Ω
Optical Power handling		300	500	mW
Tap Response @ 1550nm <sup>[8]</sup>	12	15	40	mA/W
Tap directivity		N/A or 25		dB
Tap Wavelength Dependence Response <sup>[6]</sup>	0.010	0.013	0.02	dB/nm
Tap Polarization Dependence Response	0.02	0.10	0.25	dB
Tap Temperature Dependence Response			0.01	dB/°C
Tap Dark Current at 5V bias @ 23°C		0.2	1	nA
Tap Dark Current at 5V bias @ 70°C		30	70	nA
Tap 3dB Bandwidth (cutoff frequency)	10			MHz
Tap Capacitance		12		pF
Operating Temperature	-5		75	°C
Storage Temperature	-40		85	°C

Notes:

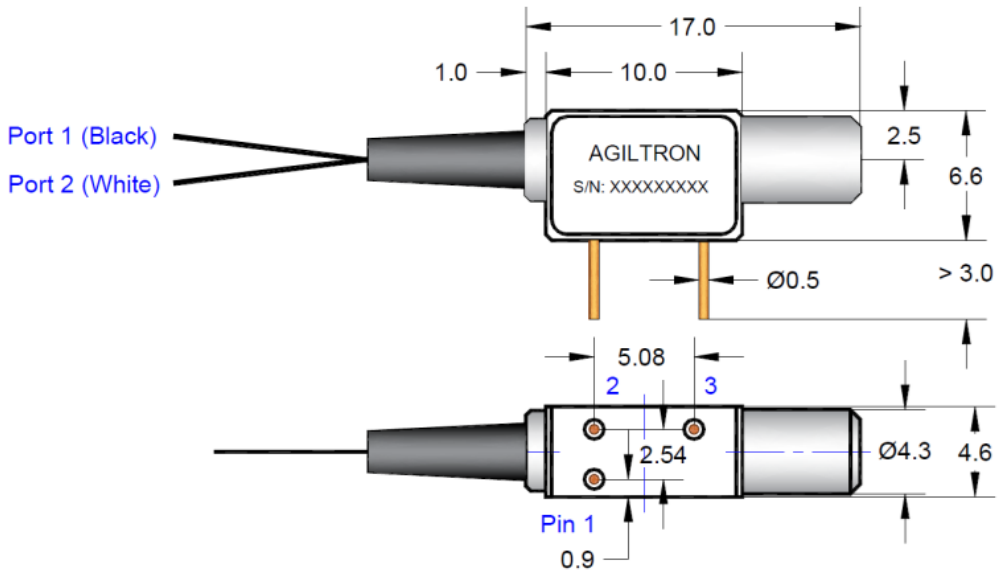
- [1]. Without connector and at room temperature
- [2]. At attenuation equal or less than 20 dB
- [3]. At 0dB attenuation and at whole temperature range
- [4]. Within 40nm Bandwidth
- [5]. At 20dB attenuation for transparent version, at 0.8dB attenuation for opaque version.
- [6]. This is related to tap ratio. The spec data is regarding 3% tap.
- [7]. Over this value will damage the device.
- [8]. For output tap monitoring, the Tap only accurately response to 15dB attenuation level.

## Features

- High Reliability
- Direct DC drive
- Ultra Small
- Integrated Tap



## Mechanical Dimension (unit: mm)



\*Product dimensions may change without notice. This is sometimes required for non-standard specifications.

## Electrical Driving Requirements

Resistance load device, no polarity, insensitive to ESD.

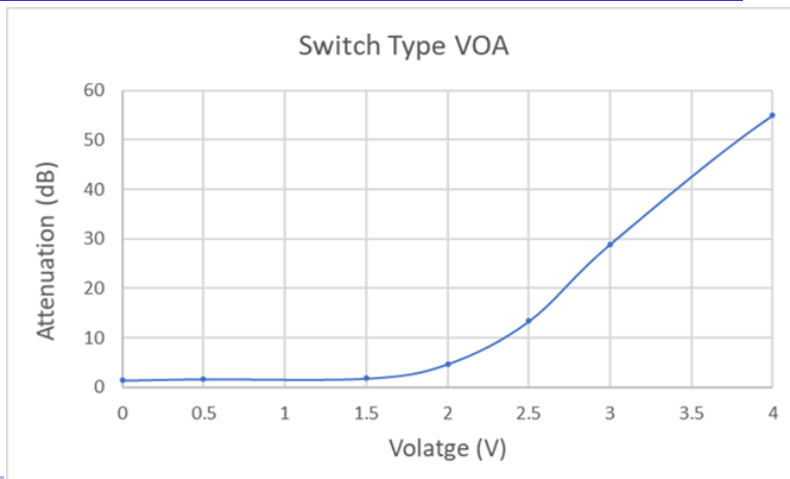
**Warning: Damaged if applying voltage over the maximum (even for a short time)**

Pin 1 = NC

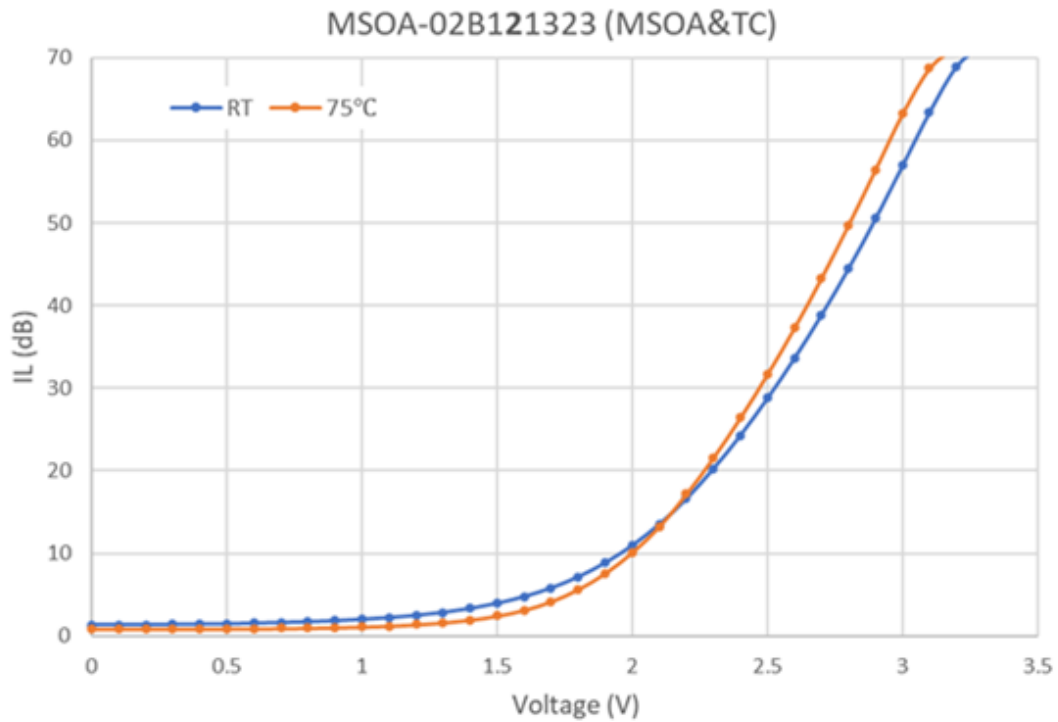
Pin 2 = 0V

Pin 3 = 4.5V (maximum)

## Response Curve



## Typical Compensated Temperature Dependence



## Ordering Information

MRAT-	Non-Power State	Wavelength	Tap Type	Package	Fiber Type	Fiber Length	Connector	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Transparent=01 Opaque =02	1260-1620=B 1060=1 1310=3 1550=5 850 =8 1310/1550=9 850/1310=A Special=0	Input =1 Output= 2	Standard Reflection =3  Reflection Temperature compensated =4  Special=0	SMF-28=1 Panda 250 PM=B MM 50/125=5 MM 62.5/125=6 Special=0	Bare fiber=1 900 μm tube=3 Special=0	0.25m=1 0.5m=2 1.0m=3 Special=0	None=1 FC/PC=2 FC/APC=3 SC/PC=4 SC/APC=5 LC=7 Special=0